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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WOO, ISAAC M

ART UNIT

PAPER NUMBER

2162

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

10/027,309

Applicant(s)

LESLIE, HARRY ANTHONY

Examiner

Isaac M Woo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32 is/are allowed.
- 6) ☒ Claim(s) 1-21, 23-31, 33-39 and 41-43 is/are rejected.
- 7) ☒ Claim(s) 22 and 40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This action is in response to Applicant's Amendments, filed on August 03, 2004 have been considered but are deemed moot in view of new ground of rejections below.
2. Claims 1, 3, 6, 8, 10, 13, 21 and 31 amended. Claims 37-43 are newly added. Claims 1-43 are pending.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-21, 23-31, 33-39 and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri et al (U.S. Patent No. 6,529,901, hereinafter, "Chaudhuri") in view of Beavin et al (U.S. Patent No. 6,272,487, hereinafter, "Beavin").

With respect to claims 1, 8, 21, 31, 37 and 41, Chaudhuri discloses, collecting a plurality of single column statistics for a plurality of columns (col. 6, lines 4-28), the plurality of single column statistics providing an estimate of row counts (col. 16, lines 57-

67 to col. 17, lines 1-10) and unique entry counts for a single column operator, see (col. 6, lines 4-28); selecting a preferred single column statistic from the plurality of single column statistics according to a predetermined criteria (col. 8, lines 5-39); storing the preferred single column statistic, see (fig. 2, col. 5, lines 32-64); determining a selectivity estimate for predicates in the query using the preferred single column statistic (col. 10, lines 37-51), the selectivity estimate being used in optimizing processing of the query by the database management system, see (col. 2, lines 3-61). Chaudhuri does not explicitly disclose, cross product of row counts for two columns selected from the plurality of columns. However, Beavin discloses, "this invention collects multi-column statistics, by a database management system, to reflect a relationship among multiple columns of a table in a relational database. These statistics are stored in the system catalog, and are used during query optimization to obtain an estimate of the number of qualifying rows when a query has predicates on multiple columns of a table, see (abstract), and "this invention to use multi-column statistics to compute an estimate of the number of qualified rows when a query has predicates on multiple columns of a table", see (col. 2, lines 25-67). This teaches that the multi-column statistics (includes two columns) is used for determining the number of rows that qualifies the query predicates. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to modify Chaudhuri by incorporating cross product of row counts for two columns selected from the plurality of columns with the system of Beavin. Thus, one having ordinary skill in the art at the time the invention was made would have found it motivated to use such a modification because that would

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provide Beavin's system the qualified row counts for multiple column statistics for optimizing the query in the data retrieval system.

With respect to claim 2, Chaudhuri discloses, predetermined criteria is a maximum of unique entry counts, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claims 3 and 10, Chaudhuri discloses, calculating the selectivity estimate as the division of the cross product and the maximum of unique entry counts, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claims 4 and 11, Chaudhuri discloses, plurality of single column statistics are selectivities, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claims 5, 12 and 14, Chaudhuri discloses, predetermined criteria is a minimum of selectivities, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claim 6, Chaudhuri discloses, calculating the selectivity estimate as the product of the minimum of selectivities and the cross product, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claims 7, 15, 19, 25 and 35, Chaudhuri discloses, plurality of columns are dependent on each other, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claim 9, Chaudhuri discloses, first predetermined criteria is a maximum of unique entry counts, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claim 13, Chaudhuri discloses, calculating the selectivity estimate as the product of the minimum of selectivities and the cross product, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claim 16, Chaudhuri discloses, selectivity estimate is within a range between the first and second preferred single column statistics, see (col. 16, lines 57-67 to col. 17, lines 1-10).

With respect to claims 17, 23, and 33, Chaudhuri discloses, the plurality of columns are substantially independent of each other, see (col. 8, lines 4-67 to col. 9, lines 1-57, col. 11, lines 17-67 to col. 12, lines 1-34).

With respect to claims 18 and 20, Chaudhuri discloses, the selectivity estimate is substantially equal to the first preferred single column statistic, see (col. 8, lines 4-67 to col. 9, lines 1-57, col. 11, lines 17-67 to col. 12, lines 1-34).

With respect to claims 24-27, Chaudhuri discloses, the selectivity estimate range is substantially equal to the first selectivity, second, see (col. 8, lines 4-67 to col. 9, lines 1-57, col. 11, lines 17-67 to col. 12, lines 1-34).

With respect to claims 28-29, 34 and 36, Chaudhuri discloses, the estimate of the dependency of the columns is used to determine the third selectivity estimate, see (col. 8, lines 4-67 to col. 9, lines 1-57, col. 11, lines 17-67 to col. 12, lines 1-34).

With respect to claim 30, Chaudhuri discloses, the third selectivity estimate is chosen to be in a central range between the first and second selectivity estimates, see (col. 1, lines 33-67, col. 6, lines 29-67 to col. 7, lines 1-52).

With respect to claim 38, Chaudhuri discloses, join selectivity of two columns further based on a cross product of row counts estimated for each of the two columns, see (col. 1, lines 33-67, col. 6, lines 29-67 to col. 7, lines 1-52).

With respect to claim 39, Chaudhuri discloses, row counts are estimated by a quantity of unique entry counts for each of the two columns, see (col. 1, lines 33-67, col. 6, lines 29-67 to col. 7, lines 1-52).

With respect to claim 42, Chaudhuri discloses, determining a join selectivity for two columns is further based on a second selectivity value that assumes the two

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columns are independent, see (col. 1, lines 33-67, col. 6, lines 29-67 to col. 7, lines 1-52).

With respect to claim 43, Chaudhuri discloses, join selectivity for two columns is further based on a skew calculation that provides a correction if the two columns have different row count to unique entry count ratios, see (col. 1, lines 33-67, col. 6, lines 29-67 to col. 7, lines 1-52).

#### ***Allowable Subject Matter***

5. Claim 32 is allowed over prior art. Claims 22 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


**Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isaac M Woo whose telephone number is (571) 272-4043. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IMW  
January 5, 2005

  
JEAN M. CORNEILUS  
PRIMARY EXAMINER